

IN THE CLAIMS:

Please substitute the following claims for the same-numbered claims in the application:

1. (Previously Presented) A method of detecting abnormal plasma discharge in a chamber, said method comprising:
 - providing an input signal to said chamber;
 - monitoring impedance of said chamber; and
 - detecting whether an abnormal plasma discharge exists in said chamber by detecting an abrupt change in said impedance.
2. (Currently Amended) The method in claim + 10, wherein said input signal comprises a ramped signal.
3. (Currently Amended) The method in claim + 10, wherein said ramped signal includes one of a step ramped signal and a smooth ramped signal.
4. (Currently Amended) The method in claim + 10, wherein said input signal comprises a radio frequency (RF) signal.
5. (Currently Amended) The method in claim + 10, wherein said impedance indicates the voltage of the chamber.

6. (Currently Amended) The method in claim 4 10, wherein said abrupt change in said impedance comprises an abrupt drop in peak-to-peak voltage of said chamber.

7. (Currently Amended) The method in claim 4 10, wherein said abrupt change comprises a drop in peak-to-peak voltage of greater than 5%.

8. (Currently Amended) The method in claim 4 10, wherein said process of providing said input signal uses electrical contacts connected to said chamber and said process of monitoring said impedance measures impedance of said electrical contacts.

9. (Cancelled).

10. (Currently Amended) The method in claim 9, A method of detecting abnormal plasma discharge in a chamber, said method comprising:

providing an input signal to said chamber;

monitoring impedance of said chamber; and

detecting whether an abnormal plasma discharge exists in said chamber by detecting an abrupt change in said impedance,

wherein said abnormal plasma discharge comprises plasma leakage, and

wherein said plasma leakage comprises formation of a region of secondary plasma in a location different from a primary plasma formation location.

11. (Previously Presented) A method of detecting plasma leakage in a reactive ion etching (RIE) chamber, said method comprising:

providing an input signal to said chamber using electrical contacts;

gradually increasing the power of said input signal;

monitoring impedance of said electrical contacts to determine the voltage of said chamber; and

detecting whether plasma leakage exists in said chamber by detecting an abrupt drop in peak-to-peak voltage of said chamber.

12. (Currently Amended) The method in claim 11 16, further comprising recording the power at which said abrupt drop occurred.

13. (Currently Amended) The method in claim 11 16, wherein said process of gradually increasing the power of said input signal comprises supplying one of a step ramped signal and a smooth ramped signal.

14. (Currently Amended) The method in claim 11 16, wherein said input signal comprises a radio frequency (RF) signal.

15. (Currently Amended) The method in claim 11 16, wherein said abrupt drop comprises a drop in said peak-to-peak voltage of greater than 5%.

16. (Currently Amended) The method in claim 11, A method of detecting plasma leakage in a reactive ion etching (RIE) chamber, said method comprising:
providing an input signal to said chamber using electrical contacts;
gradually increasing the power of said input signal;
monitoring impedance of said electrical contacts to determine the voltage of said chamber; and
detecting whether plasma leakage exists in said chamber by detecting an abrupt drop in peak-to-peak voltage of said chamber

wherein said plasma leakage comprises formation of a region of secondary plasma in a location different from a primary plasma formation location.

17. (Previously Presented) The method in claim 11 16, further comprising:
maintaining a history of power levels associated with an onset of plasma leakage for each type of defect;
measuring a power level at which said abrupt drop in peak-to-peak voltage occurred; and
correlating said power level with a specific type of chamber defect maintained in said history.

18-20. (Canceled).

21. (Previously Presented) A method of detecting abnormal plasma discharge in a chamber, said method comprising:

providing an input signal to said chamber, wherein said input signal comprises a ramped signal;

monitoring impedance of said chamber; and

detecting whether an abnormal plasma discharge exists in said chamber by detecting an abrupt change in said impedance.